Operating Instructions

HYDROVAR®

HVS 1.1-HVS 1.2
HVS 3.2-HVS 3.4

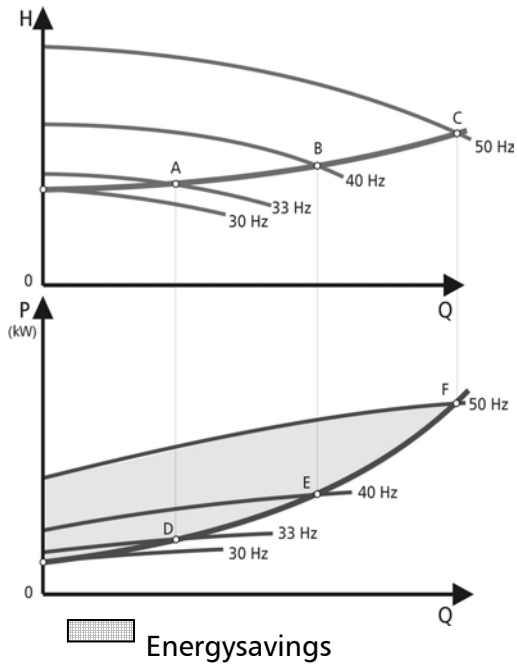
SENSORLESS

English

771079102-HVS1.1-3.4-VL-EN

ITT Industries
Engineered for life

HYDROVAR sensorless



The idea is to control the pump speed according to the power consumption of the motor instead to the head of the pump.

Each working point at a defined speed on the curve of required pump head in the hydraulic diagram (A,B,C) has also a corresponding point in the electric performance diagram (D,E,F).

Each of these points is defined by the power consumption at the same speed. All these points of power consumption at different speeds results in a pretended curve of power consumption at different speeds.

If the controller varies the speed of the pump at different flow values so that the power consumption moves along this curve and the working point of the pump in the hydraulic diagram will also move along the corresponding curve of pump head but without measuring this head.

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1. Important safety instructions

	Read and follow the operating instructions and safety instructions carefully before starting operations! All modifications must be done by qualified technicians!	

In addition to the instructions contained in these operating instructions please pay attention to universal safety and accident prevention regulations.

Warns that failure to observe the precaution may cause electric shock.

Warns that failure to observe the precaution may cause personal injury or damage to property.

The HYDROVAR drive head has to be disconnected from the power supply before any work can be carried out in the electrical or mechanical part of the system.
Installation, maintenance and repair work may only be carried out by trained, skilled and qualified personnel.
Unauthorised modifications or changes to the system make all guarantees null and void.
When in operation the motor can be stopped by remote control, where by the drive head and the motor remain under voltage. For safety reasons, the unit must be disconnected from the power supply when carrying out work on the machinery as locking out the equipment by switching off the release mechanism or set value cannot prevent accidental starting of the motor.

When the drive head is connected to power supply, the components of the power unit as well as certain components of the master control unit are also connected to the power supply.

Touching these components seriously endangers life!

Before removing the frequency inverter cover the system must be disconnected from the power supply. After switching off the power supply wait **at least 5 minutes** before starting work on or in the HYDROVAR drive head (the capacitors in the intermediate circuit have to be discharged by the installed discharge resistors first).

Voltages of up to 400 volts are possible (if there are faults it can be higher).

All work carried out when the frequency inverter is open may only be performed by qualified authorised staff.

Furthermore, care must be taken not to short circuit the neighbouring components when connecting the external control wires and that open cable ends which are not in use are insulated.

The HYDROVAR drive head contains electronic safety devices which switch off the control element in the event of faults, whereby the motor has zero current but remains energised and comes to a halt. The motor can also be halted by mechanical blocking. If it is switched off electronically the motor is disconnected from the mains voltage through the electronics of the frequency converter but is not potential-free in the circuit.
In addition voltage fluctuations, especially power failures can cause the system to switch off itself.
Repair of faults can cause the motor to start up again.

The system may only be put into operation when it has been earthened. In addition, equipotential bonding of all pipes must be ensured.

The operating instructions have to be read, understood and followed by the operating personnel. We point out that we accept no liability for damage and operating disorders which are the result of non-compliance with the operating instructions.

NOTICE!	High voltage tests of the inverter or the motor may damage the electronic components! Hence bridge before the in- and outgoing terminals L -N -- U- V-W. To avoid incorrect metering by capacitors incorporated in the electronic part isolate the motor from the Hydrovar Drive head.

Preliminary Inspection
Visual Inspection
Upon delivery, check the integrity of the packaging.
After you have removed the external packaging, visually inspect the converter to make sure it has suffered no damage during transport. If any damage is visible, inform your distributor within 8 days from the delivery date.

Handling and Storage
The product must be lifted and handled carefully.
During transport and storage, protect the converter from humidity and mechanical damage caused by impacts, falls, etc...
ATTENTION: Dispose of all packing materials in accordance with local regulations.

2. Technical Data - Frequency Inverter and General Data

HYDROVAR		Hydrovar output to the Motor		Supply Voltage (U_{in})	Prefuse min.
Type HVS	Rated output	Voltage	Max. current	Mains frequency 48-62 Hz	Ampere
1.1	1,1 kW	3x0-U_{in}	4,8 A	1x220-240V ±15%	10
1.15	1,5 kW	3x0-U_{in}	7,0 A	1x220-240V ±15%	16
1.2	2,2 kW	3x0-U_{in}	10,0 A	1x220-240V ±15%	20
3.2	2,2 kW	3x0-U_{in}	5,7 A	3x380-460V ±15%	10
3.3	3 kW	3x0-U_{in}	7,3 A	3x380-460V ±15%	13
3.4	4 kW	3x0-U_{in}	9 A	3x380-460V ±15%	16

Output voltage: 3x 0...U_{in} VAC / 0-70 Hz
(depends on the input voltage)
Min. frequency: 0 – max. frequency
Electrical efficiency: > 95%

Protection against: Short circuit, over- and undervoltage, overheating of the electronics (overload) and additional external protective functions via PTC (motor temperature) and low water switch.
A mains filter is fitted to ensure interference immunity.

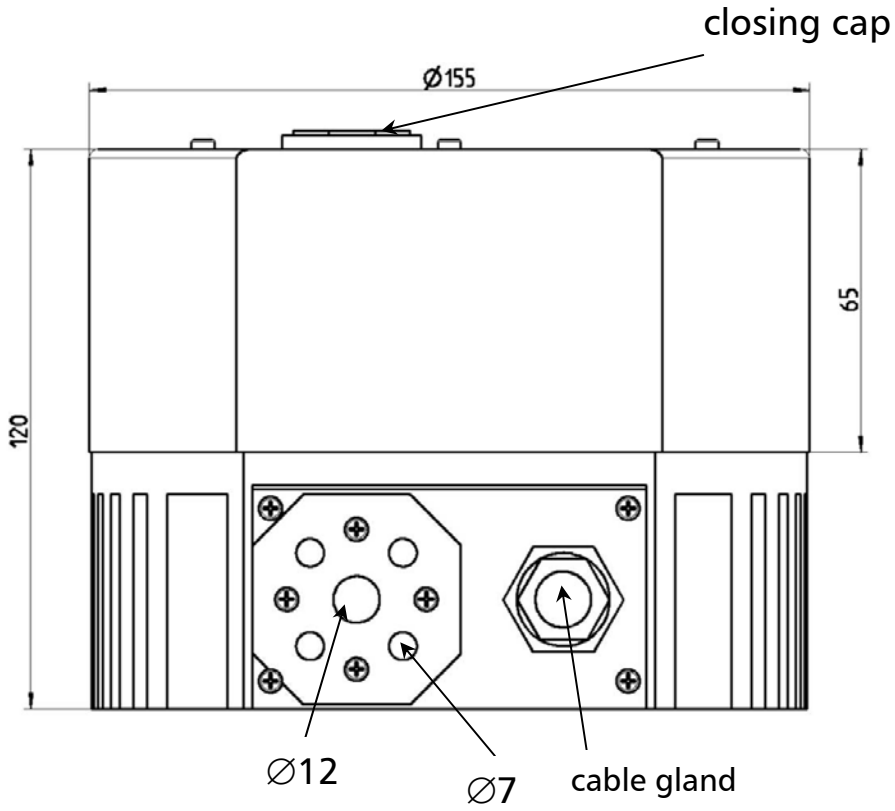
The HV Series frequency converter complies with the general EMC provisions and has been tested according to the following standards:

- Disturbance voltage: EN 55011
- EMC – Immunity: EN 61000-4-3 and ENV 50204
- Electrostatic discharge: EN 61000-4-2

Ambient temperature: 5° C ... + 40°C
Storage temperature: -25° C ... + 55° C
(+70°C during max. 24 hours.)
Humidity: rH max. 50% at 40°C, unlimited
rH max. 90% at 20°C, max. 30 days per year
Condensation not permitted !
Air pollution: The air may contain dry dust as found in workshops where there is no excessive quantity of dust due to machines. Excessive amounts of dust, acids, corrosive gases, salts etc. are not permitted
Altitude:: max. 1000m above sea level
At sites over 1000 m above sea level, the maximum output power is derated by 1% for every additional 100m.
If the installation site is higher than 2000 m above sea level, please contact your local distributor.
Class of protection : IP55

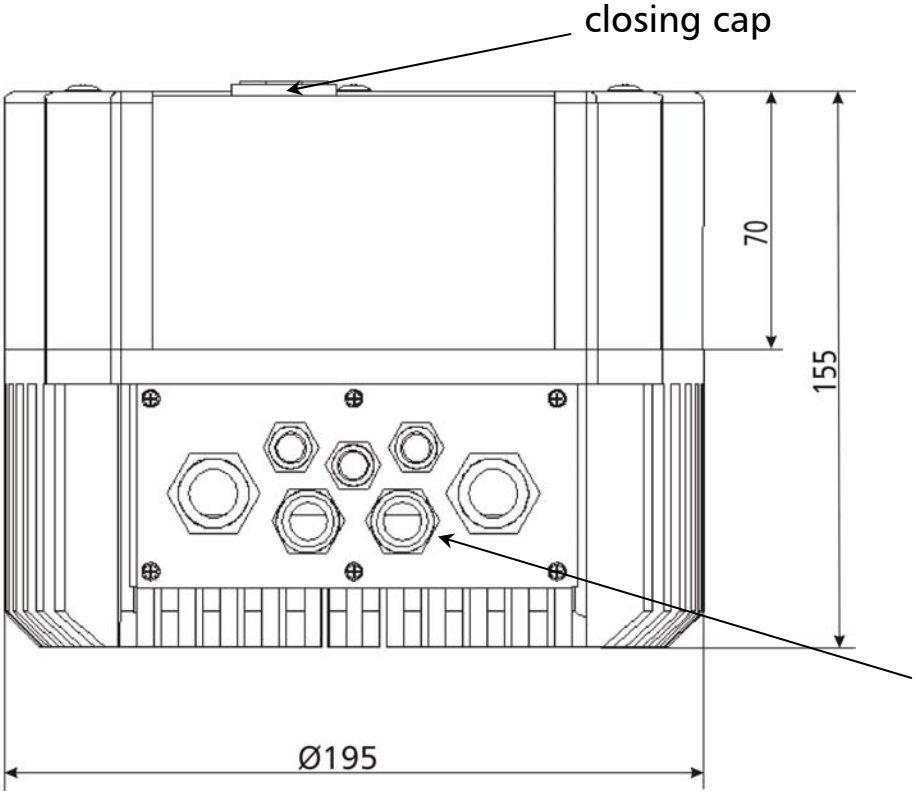
2.1 Dimensions

HVS 1.1:



Type:	Weight
	[Kg]
HVS 1.1	2,00
HVS 1.15	4,70
HVS 1.2	4,70
HVS 3.2	4,70
HVS 3.3	4,70
HVS 3.4	4,70

HVS 1.15/1.2/3.2/3.3/3.4

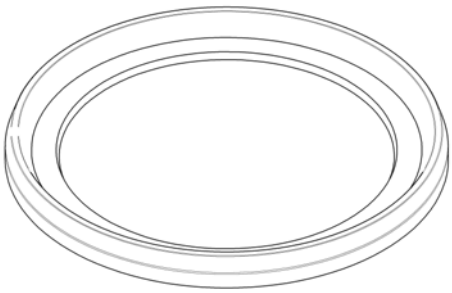


3. HYDROVAR mounting

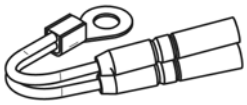
3.1 Mounting the HYDROVAR on the pump

3.1.1 Included components

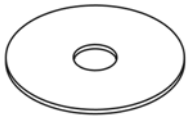
Variant for HVS 1.1:



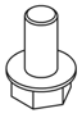
mounting and distance ring



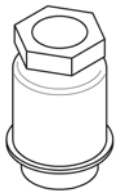
thermistor



washer

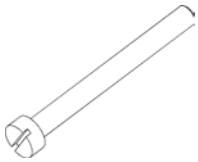


screw

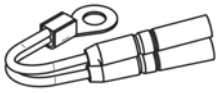


cable gland

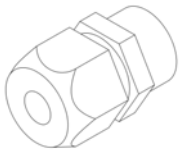
Variant for HVS 1.15/HVS 1.2/HVS 3.2/HVS 3.3/HVS 3.4:



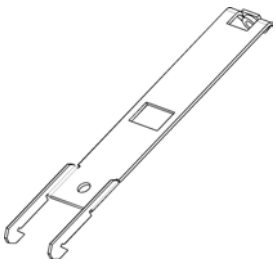
screw M5x50



thermistor



cable gland



mounting clamp

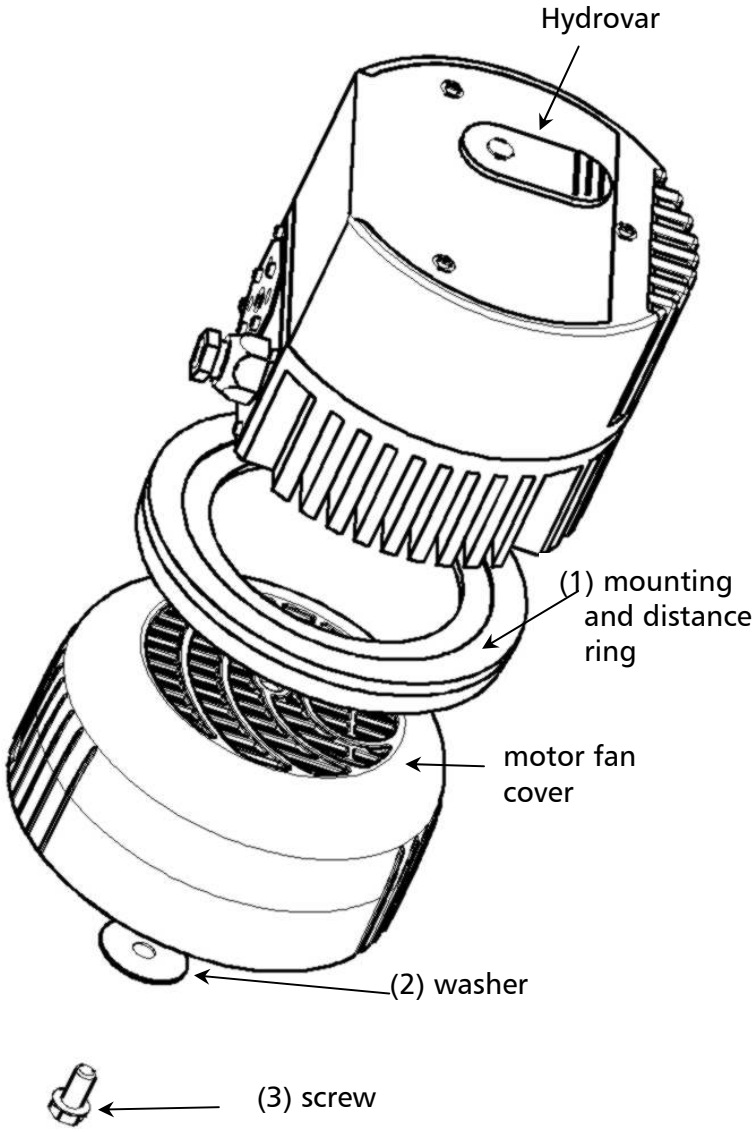
3.1.2 Mechanical mounting

Variant for HVS 1.1

1. Remove the motor fan cover from your 3-phase motor by removing the mounting screws.

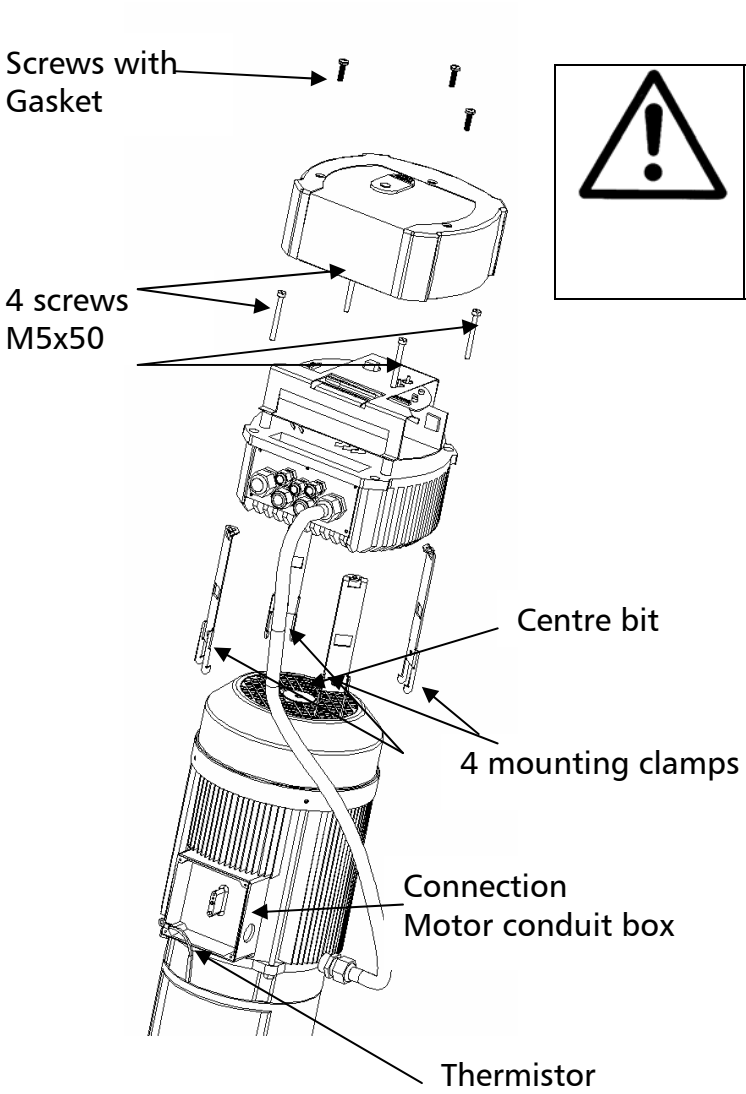
2. Put the mounting and distance ring (1) between the fan cover and the Hydrovar and fix them together with the screw (3) by using the included washer (2).

3. Use the fan cover screws to mount the fan cover/Hydrovar combination to the motor

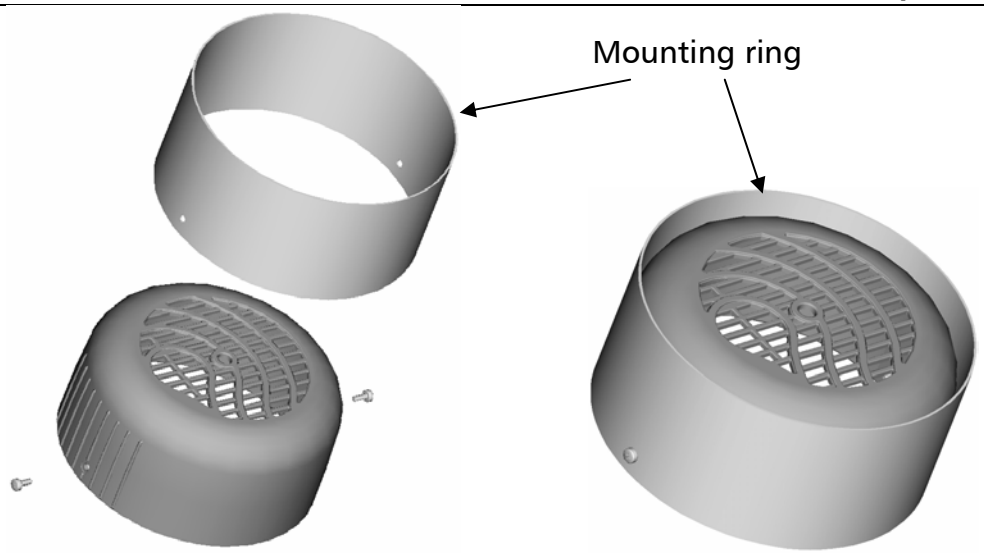


CAUTION!:
Don't forget the washer between the screw and the motor fan cover!

Variant for HVS 1.15/HVS 1.2/HVS 3.2/HVS 3.3/HVS 3.4:



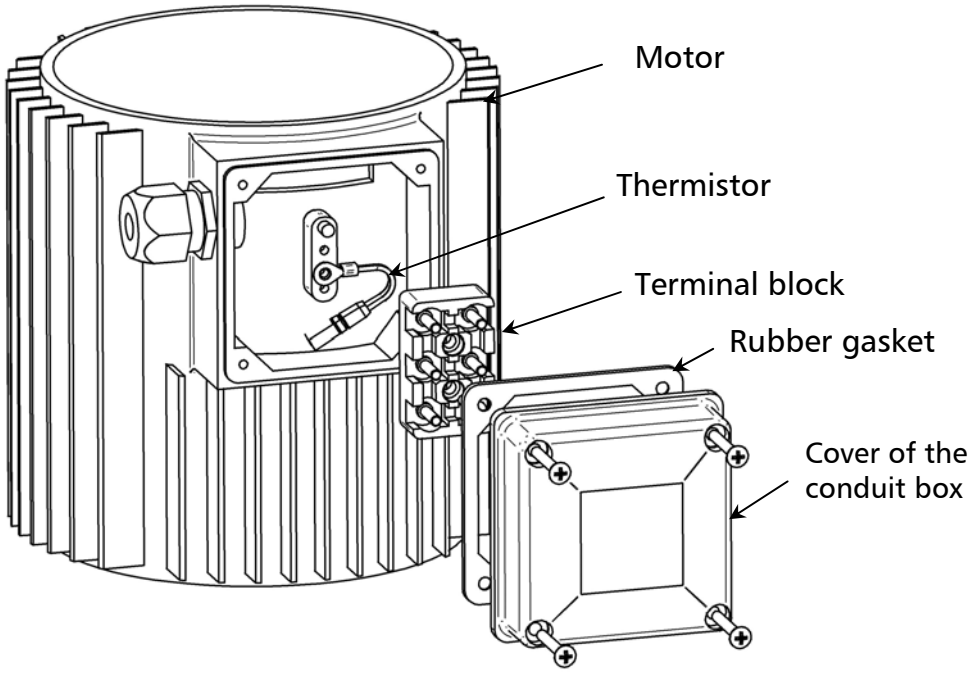
	CAUTION! Don't forget the gaskets for the 3 screws. Ensure that there is no water on the unit before you open the cover.



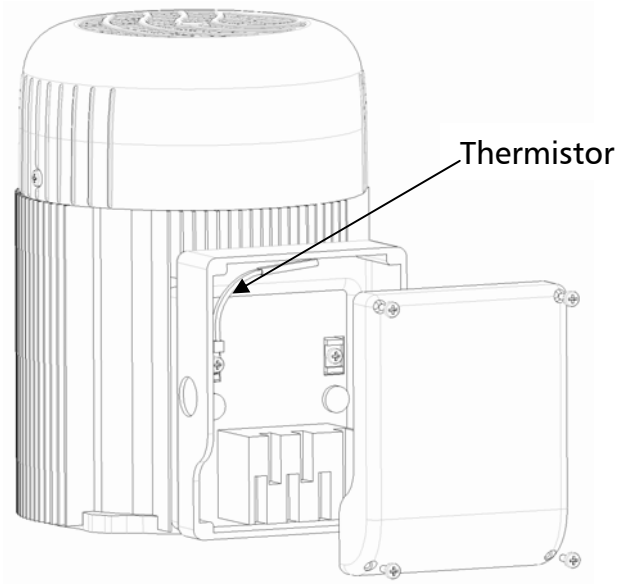
	CAUTION! If you use a motor with plastic fan cover, you have to use a mounting ring.

3.1.3 Mounting the Thermistor

Variant A:



Variant B:



1. Open the cover of the conduit box and remove also the terminal block inside.
2. Fix the Thermistor (Variant A or B)
3. Electrical connection of the motor cables

3.2 Electric installation and wiring

NOTICE!
All installations and maintenance have to be performed by trained and qualified personnel with proper tools!!

WARNING!
In case of a failure, disconnect and lockout electrical power and wait five minutes for capacitor discharge before servicing the Hydrovar. Otherwise it can cause shock, burns, or death.

3.2.1 Means of protection

Ask your power supply company which means of protection are required.

Applicable: AC and DC current-operated circuit breaker (FI), TN systems, protective circuits.

When using a FI protection switch, make sure that it also releases in the event of a DC fault, use for each Hydrovar a separate FI-switch!

3.2.2 Wiring the Hydrovar to the motor

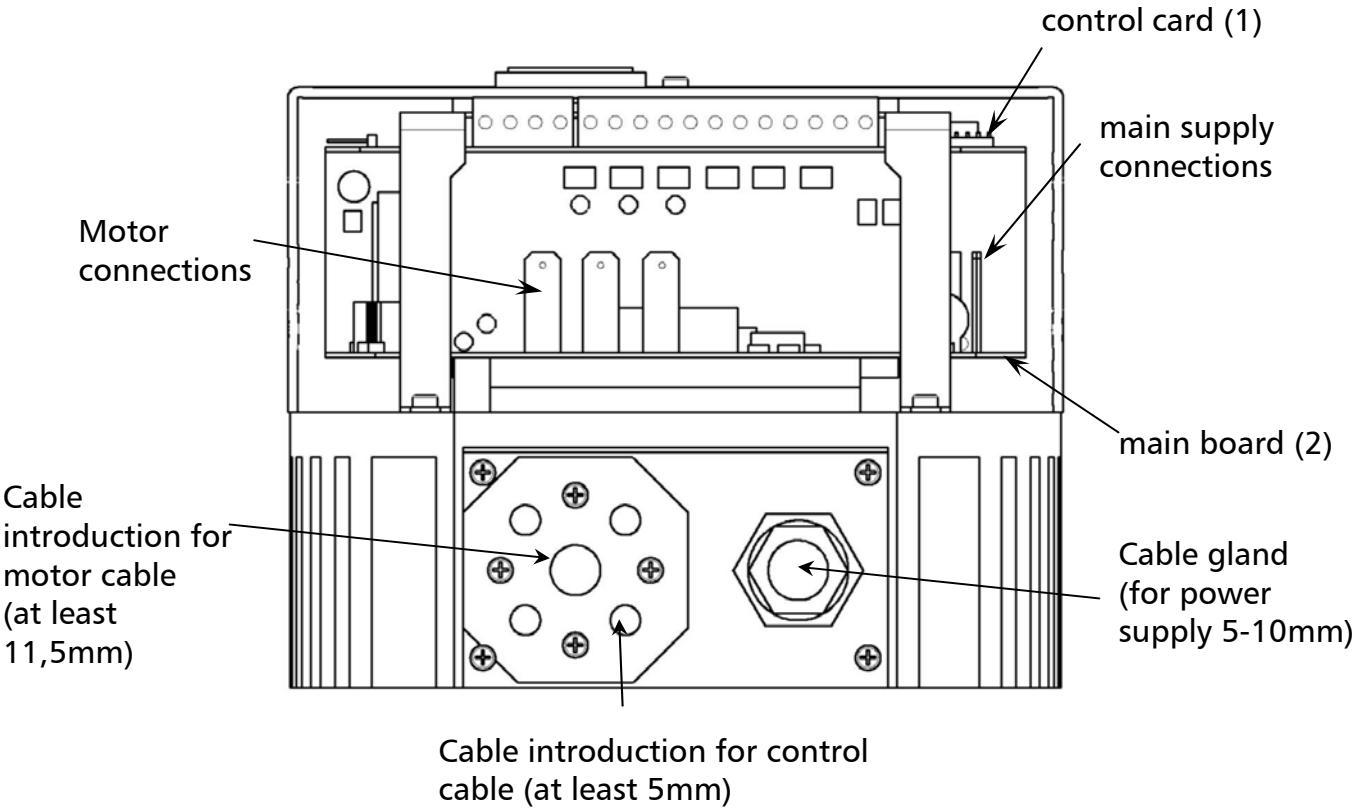
Remove the 3 screws holding the top of the Hydrovar. Carefully lift the top, loose the earth screw and put the Hydrovar cover aside.
Now you can see the 2 main parts

(1) control card with all terminals for the control signals and the RS485 interface

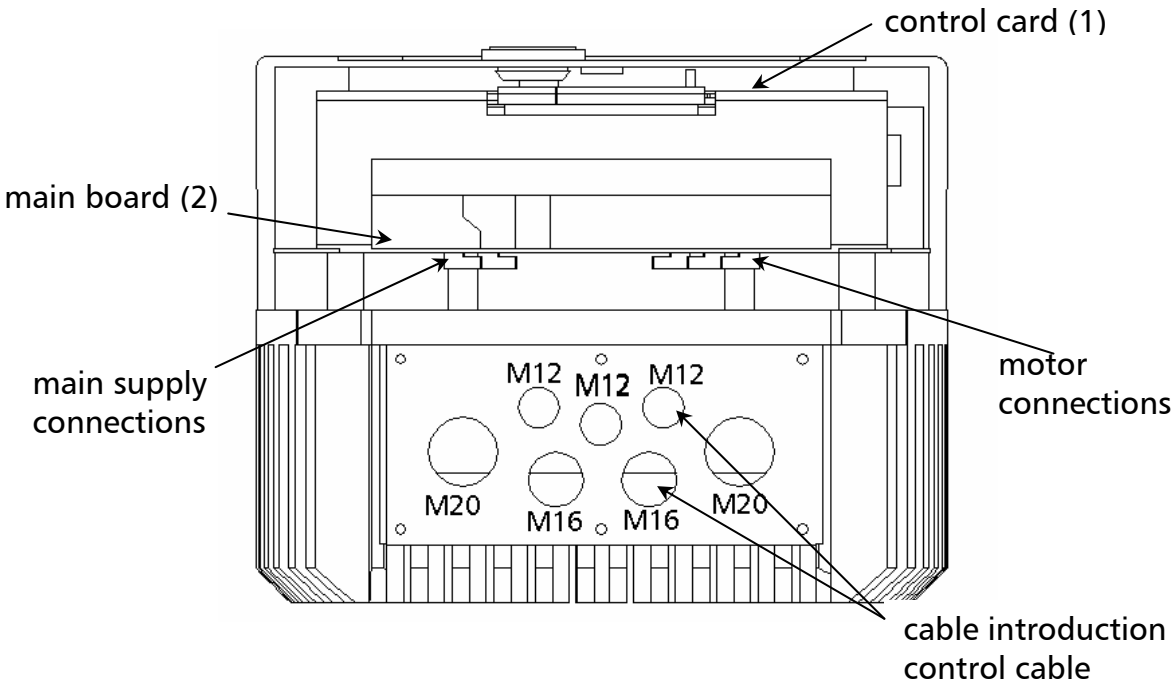
(2) main card with all power components and terminals for power supply and motor

3.3 Main part overview

HVS 1.1:


control card (1)
main supply connections
Motor connections
main board (2)
Cable introduction for motor cable (at least 11,5mm)
Cable gland (for power supply 5-10mm)
Cable introduction for control cable (at least 5mm)

HVS 1.15/HVS 1.2/HVS 3.2/HVS 3.3/HVS 3.4:



3.4 Connecting the power cables

a) motor cable:

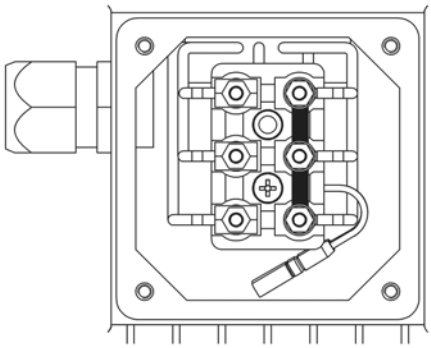
Locate the motor connections inside the Hydrovar. Connect wires to the terminals and rout the cable through the cable gland.
You must take a motor cable at least Ø 11.5mm if you want protection IP55. (only HVS 1.1)

The earth-wire of the cable has to be fixed with the screws with the earth-symbol to the cooling body of the Hydrovar.

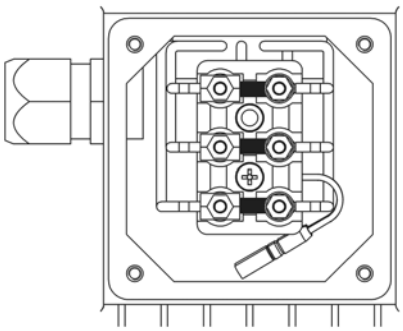
b) Connections in the conduit box

The connection of the motor cable depends on the type of the motor and can be done in star or delta connection:
(you have to use the connection for a motor voltage of 3x230V shown on the motor label)

Star-connection



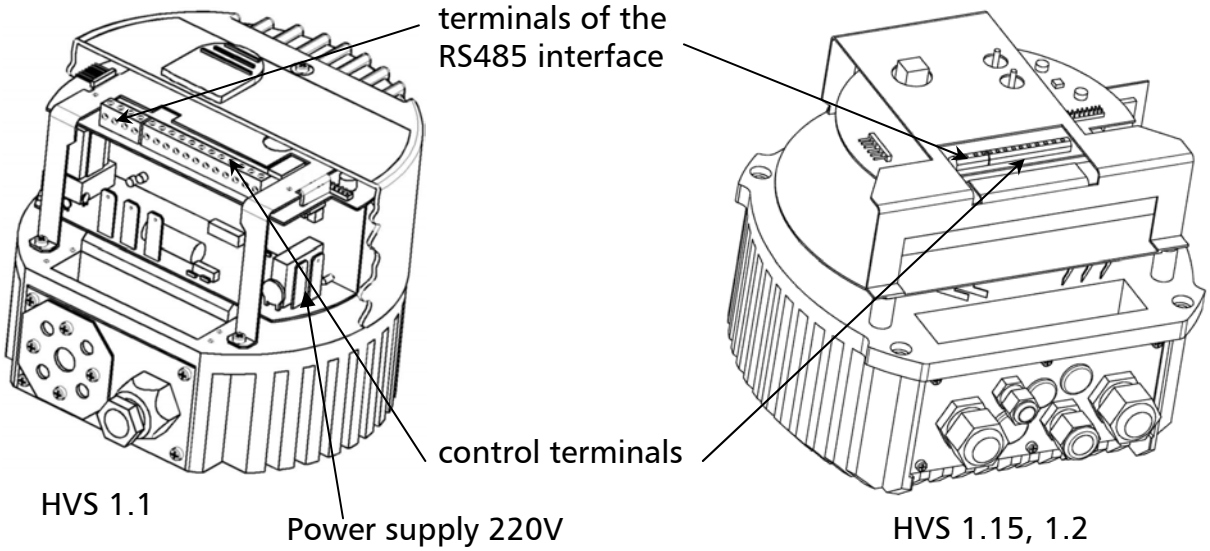
Delta-connection



c) supply cable

The main power cable is connected to the terminals labelled L1, N for the 230 VAC, single phase unit; or L1, L2, L3 for the 3x400VAC, three phase unit.

Control terminals



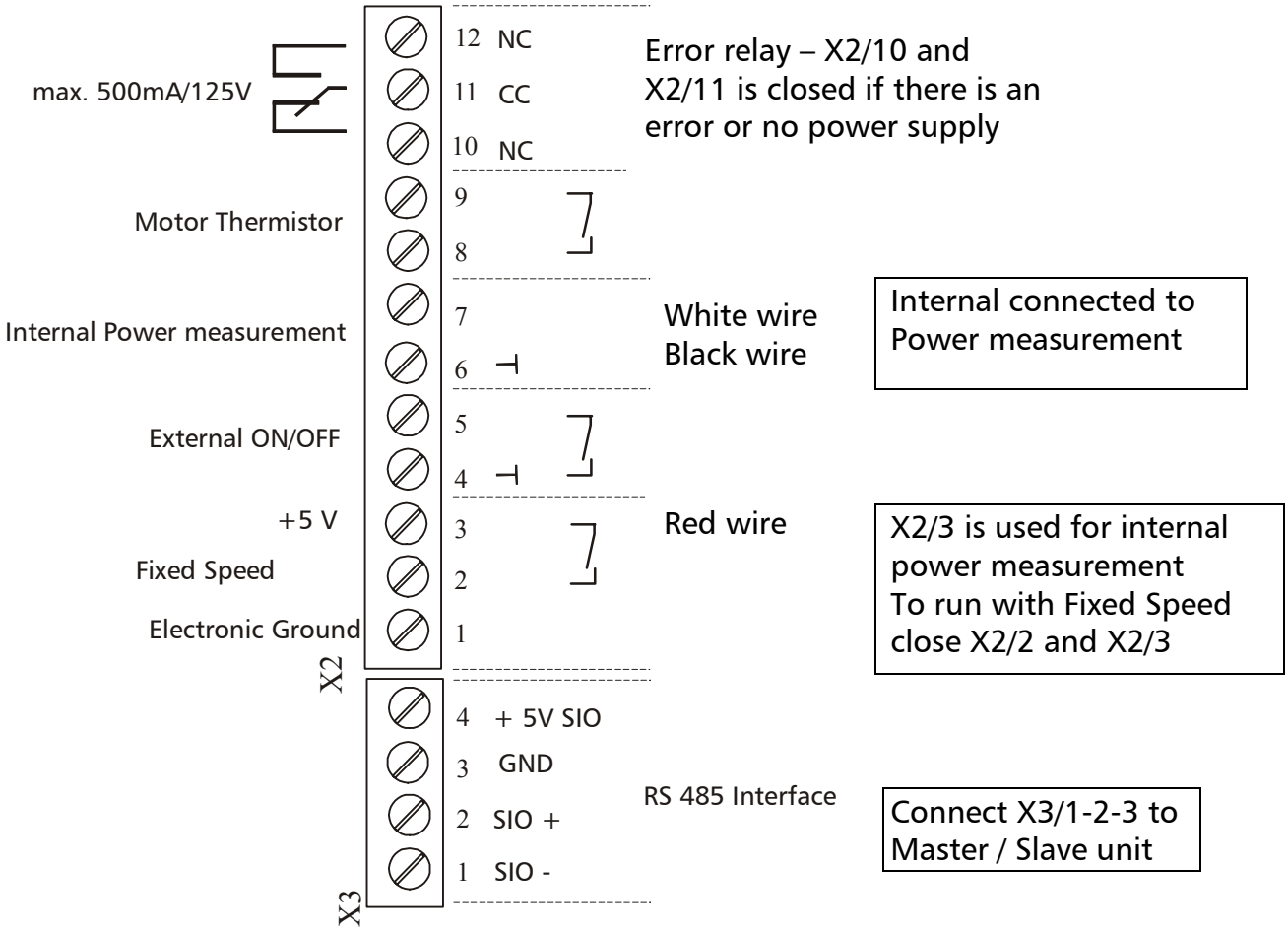
3.4.1 Control Terminals

All external used cables have to be ***shielded***. Do not connect the mass of the electronic components to other higher potentials.

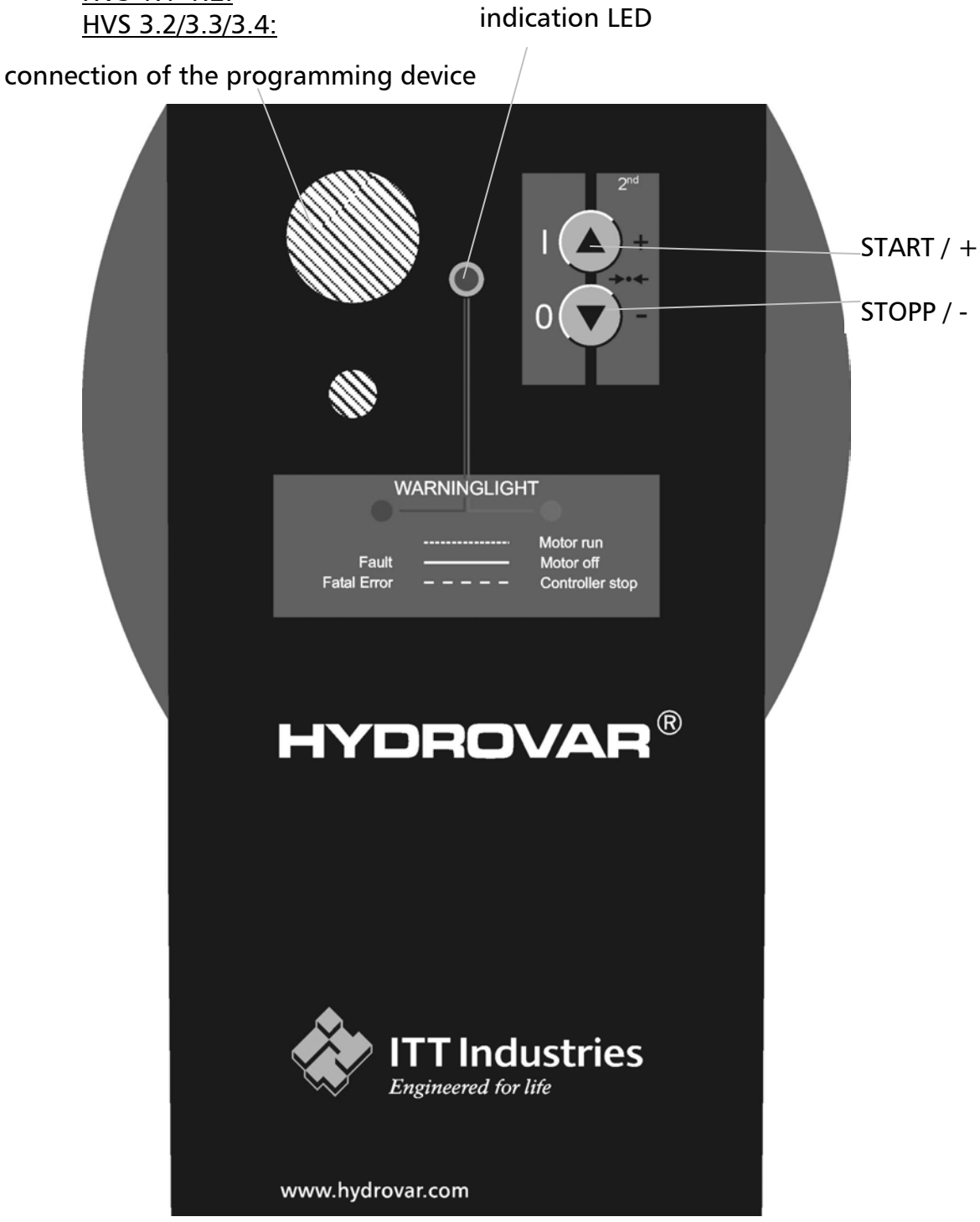
All electronic ground and GND of the RS 485-interface are connected internal.
For external off/on and low water, switch contacts suitable for <10 V are necessary.
The control cable must be at least Ø 5mm.

If unshielded control cables are used, signal interference may occur and interfere with the function of the inverter.

Control-Terminals:



3.5 Front plate



4 Function buttons of the HYDROVAR

CAUTION!	Before you start the system, the pump has to be filled and all wiring and piping has to be done!

The Hydrovar is delivered with the following settings as default:

Learning: enabled – allows to learn a reference curve
Auto Start: enabled – after power supply automatic start

Other possibilities to use the push buttons of the Hydrovar:

START – Press ▲ button (if Autostart is disabled, the pump can be started by pressing the ▼ button and then the ▲ button at the first start up or after a power supply failure) or

STOP - Press the ▼ button.

Both buttons are located on the front plate of the Hydrovar

- **Set Frequency for constant speed**

For changing the speed without the **external programming device,** you have to do the following:

1.) Press button ▼ to stop pump

2.) Press the ▲ and ▼ buttons together for more than 10 sec, the colour of the LED changes to orange after 5 seconds and after further 5 seconds the LED changes to orange fast flashing.

3.) Now you can change the speed of the pump by using the button ▲ (higher frequency) or ▼ (lower frequency**).**
(If the external programming device is connected with HYDROVAR, the power as well as the frequency is shown on the display and you can also change the frequency with the ▲ and ▼ buttons of the programming device.)

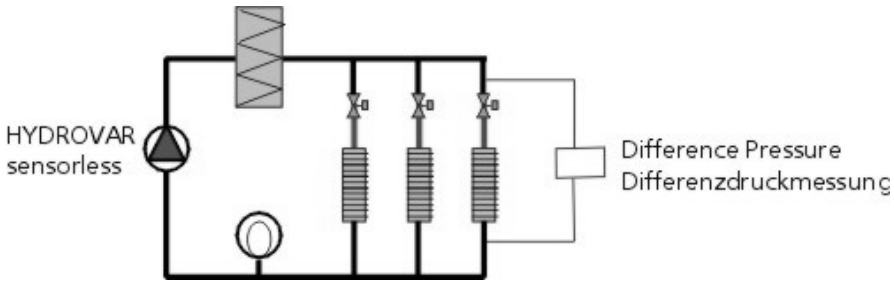
4.) When you have selected the right frequency, don't press a button for 5 seconds and that speed is saved automatically. Also after power supply fault the pump will run on this speed.

5.) Press the ▲ and ▼ buttons together for 5 seconds the pump will stop.
If you have stored system points the HYDROVAR start with automatic mode.

5 Learning a System Curve to adapt the system's requirements

CAUTION!	Before you start the system, the pump has to be filled and all wiring and piping has to be done!

The learning of the system's required curve depends on the saved system points. It is necessary to start at flow=0 and to save at least four system points up to a maximum of 12 points.



Learning:

Before you start to learn, it is important that the motor was running with constant speed to reach the operation temperature. Then you can choose between learning the first point and select one of the pre programmed reference curves (only by using the external programming unit) or learn 3 up to 12 points to run along the optimum system curve.

a) Using one of the pre programmed reference curves 2..7

1.) connect the external programming device to select your favourite reference curve

2.) Stop the pump while pressing the button ▼ on the HYDROVAR.

3.) Press the ▲ and ▼ buttons together for 5 sec, the colour of the LED changes from green to orange. The pump is now ready to learn.

4.) Set now the first system point at flow=0. You can change the speed of the pump by using the button ▲ (higher frequency) or ▼ (lower frequency).
Check the difference pressure on an important point of the system to set the required frequency.
On the display of the programming device, you can see the power and the frequency.

5.) To save the learned point press the ▲ and ▼ buttons together, until the LED will begin to start fast flashing. The Hydrovar stops automatically.

This saved point is now the min. point of your selected reference curve, but it can be used for all other reference curves also.

b) Learning a complete system curve = reference curve 0 [Default]
(no external programming device required)

1.) Stop the pump while pressing the button ▼ on the HYDROVAR.

2.) Press the ▲ and ▼ buttons together for 5sec, the colour of the LED changes from green to orange. The pump is now ready to learn.

3.) Set now the first system point at flow=0. You can change the speed of the pump by using the button ▲ (higher frequency) or ▼ (lower frequency).
Check the difference pressure on an important point of the system to set the required frequency.
If external programming device is connected with HYDROVAR, you can see the power and the frequency on the display.

4.) To save the learned point press the ▲ and ▼ buttons together, until the LED will begin to start fast flashing.

5.) Increase now the flow of the pump up to 20-30% of the maximum flow. Increase also the frequency by using the button ▲ (higher frequency) or ▼ (lower frequency) to reach the required value.

6.) To save this point press the ▲ and ▼ buttons together (-> 4.)
Learn now the next points up to the maximum flow.

7.) To save the last system point and to end the learning mode you have to press the ▲ and ▼ button together after setting the last frequency, until the pump stops automatically and the LED starts shining green.
Now the required system curve is stored.

8.) If "Autostart" function is disabled start the automatic mode by pressing button ▲. The Hydrovar increases now the speed till it reaches the right point depending on the system curve.

With the programming device you are now able to change ramps and windows for a better controlling.

6 Settings at the Submenu – Programming Device

You are always able to connect the programming device to HYDROVAR.
The LED will change the colour to orange, when connection was successful.

POWER X.X % SPEED X.X Hz	The actual Power [%] and the actual output frequency [Hz] are displayed.
POWER SAVING X.XX KW	Shows the actually saved energy [kW]
TOTAL SAVINGS XX.XX EUR	Shows the whole saved energy costs (in EUR / USD / GBP / CHF)

General for operating with the external programming device:

With ← and → you can select the different parameters in the menu.
To enter a submenu, press the ↓ button. To leave the submenu, you have to press the buttons ← or → for longer than 3 sec.
With ↑ or ↓ you can change the parameters.
Each change in the settings is saved after leaving this parameter with the buttons ← or →.
When you have changed a parameter and you leave it, the LCD shows you the following message

SAVE PARAMETER	for about 2 sec.
SUBMENU PARAMETER	From the 1st display, press the → button to reach
PASSWORD 0000	Then press the ↓ button and the display will change to

NOTICE!
The Password protection prevents untrained personnel from accidentally changing the base settings

PASSWORD 0066	Press the ↑ button until you reach the number 0066

Hold the → button down to reach the next display

7 Settings at the Submenu-Parameter

IMPORTANT!
Before entering the secondary menu these instructions must be read carefully to prevent incorrect settings which will cause malfunction.

Parameter settings on the end of the manual with the number of the side and place for the changing Parameters.

7.1 Auto start

Auto Start Enabled

You can select between ↓ **Disabled** and ↑ **Enabled**

Autostart **Enabled** means that the pump starts again automatically after an interruption of the power supply (power failure).

If Autostart **Disabled** is set, the pump has to be restarted manually after a power failure, by pressing ↓ and ↑.

7.2 Submenu Inverter

Submenu Inverter

To enter this menu you have to press the ↓ button, to leave the menu, press the →button longer than 3 sec.

7.2.1 Maximum Frequency

Max. Frequency 50.0 Hz

Possible setting between min. 40 and max. 70 Hz.

Attention: Settings higher than 50 Hz may overload the motor!
Settings of 10% above nominal frequency cause 33% more power consumption!

7.2.2 Boost

B O O S T 5.0 %

The stated value determines the course of the U/f-curve.

Setting of the motor starting voltage in % of rated voltage.
Settings of 0...25% of maximum output voltage are possible. However, care should be taken that settings are kept as low as possible so that the motor does not become thermally overloaded.

7.2.3 Fixed Speed

FIXED SPEED 30.0 HZ

This speed is to run the motor with constant speed.

This speed is activated if the Digital Input (X2-2/3) is closed
or
if it is a single pump and there is ERROR POWERMEASURE detected.

This speed should be set to maintain a minimum flow (e.g. night consumption)
The energy savings are also activated with the Fixed Speed.

7.3 Submenu Controller

Submenu Controller

To enter this menu you have to press the 🡻 button, to leave the menu, press the 🡸button longer than 3 sec.

7.3.1 Function Mode

Function Mode Enabled / Disabled

Enabled: Function Mode activated, control along a calculated system curve

Disabled: Interpolation (Point to Point control) – only for special applications

7.3.2 Window Hz - Interpolation

Window 2 Hz

Window, if function mode is disabled

7.3.3 Window Fx - Function mode

Window Fx 2 %

Window, if Function Mode is enabled

7.3.4 Shift – Function mode

Shift 0.0 Hz

Oscillation of the learned system curve, if Function mode is enabled

Required Settings 0....1,5 Hz
Settings to high: oscillation is possible

This function activate an increase and decrease of speed around the actual system point.

Time setting will influence the control of the pump and SHOULD NOT BE CHANGED at normal operation. Possible settings for each ramp 0,05 - 1000 sec.

7.3.5 Accel high

Accel. High 10 Sec

Excessively fast running up time may overload the inverter.

7.3.6 Decel high

Decel. High 10 Sec

Excessively fast running down time tends to cause oscillation or hunting or can cause an error (OVER VOLTAGE) during pump down of the pump.
Excessively slow running down time tends to generate over pressure.

7.3.7 Accel Low

Accel. Low 70 Sec

Excessively fast running up time tends to cause oscillation.

7.3.8 Decel Low.

Decel. Low 70 Sec

A too fast setting leads to oscillation.

7.4 Submenu Reference Curve

Submenu Reference Curve

To enter this menu you have to press the 🡻 button, to leave the menu, press the 🡺button longer than 3 sec.

7.4.1 Reference Curve

Reference Curve 0 - 7

Change the curve by pressing 🡹 or 🡻

This parameter allows selecting different pre programmed curves.

0... Learned curve with 3 up to 12 system-points
1... previous learned system curve
2... Selection A
3... Selection B
4... Selection C
5... Selection D
6... Selection E
7... Selection F

By using reference curve 2...7 it is only necessary to learn one point at zero flow. You are also able to change the reference curve while pump is running to find the best suitable curve.
The different curves depending on the type of pump and the duty point.

7.4.2 Power / Frequency

POWER xxx FREQ xx.x HZ

Check the learned points by using 🡹 and 🡻.
(Learned points 1-12)

This parameter allows only the control of the learned points.

7.4.3 Coefficients A / B / C

These coefficients define the actual reference curve 0-7.
To change the coefficients it is necessary to know a special password.
A changing without knowledge about pump curve and power will produce a malpractice of the pump.

COEFF A / B / C x.xxx

Change value using 🡹 and 🡻. Press the 🡺 button to save and change to next coefficient.

7.5 Submenu Test-Run

Submenu Testrun

To enter this menu you have to press the ↓ button, to leave the menu, press the →button longer than 3 sec.

7.5.1 Start Test Run

Start Test Run ↑ + ↓

By simultaneously pressing ↑ + ↓ a test run will be released even if the test cycle is not set.
After starting this test run, the pump will speed up with the fasten ramp 1 to the set speed and then will ramp down with the fasten ramp 2.

7.5.2 Enable Test Run

Enable Test Run 100 h

Adjustable between 1...100 hours.
The test run starts the pump at the set time after the last stop for 20 seconds with the set speed.
Deactivating test run: Set 0 hours, by using ↑ and ↓.
Repeating the test run: Select the test run and set the desired hours using the ↑ button.

7.5.3 Test Frequency

Test Frequency 30.0 Hz

Frequency for manual and automatic test run.
Can be set from 0 Hz up to 70 Hz.

7.5.4 Boost Test Run

BOOST Test Run 10.0 %.

Start voltage in % of rated voltage in order to ensure that the motor starts safely.

7.6 Submenu Economy

Submenu Economy	To enter this menu you have to press the ↓ button, to leave the menu, press the →button longer than 3 sec.

7.6.1 Currency

CURRENCY EUR	Change the currency using ↑ or ↓.

This parameter allows you to change between EUR / USD / GBP / CHF.
This function is only important to show the right cost savings.

7.6.2 Rated Power

RATED POWER Xx KW	Maximum Power Rate of the used Hydrovar

To measure the correct energy savings it is necessary to input the maximum power rate of the unit.

7.6.3 Costs / kWh

COSTS / KWH Xx EURO	Energy costs per kWh

Input the correct energy costs for 1 kWh.

7.6.4 Clear Savings

CLEAR SAVING ↑ and ↓	Press both buttons to reset the actual energy saving to 0.

7.7 Mode Controller

MODE Single	Single pump

Select with the ↑ and ↓ "Single" (Single pump) or "Master-Slave" (up to 4 pumps).

7.8 Switch Interval

Switch Interval 0024	For changing the MASTER pump

Adjustable between 0 (de activated) and 250 hours.

7.9 Set Password

Set Password 0066	The pre-set password can be changed if necessary with the ↑ and ↓ buttons.

7.10 Learning

Learning Enabled / Disabled	Enabled – you allow to learn system points Disabled – Learn mode is deactivated

7.11 Default

Default ↑ + ↓	To load DEFAULT – PARAMETER, press buttons ↑ + ↓ together, till the timer is run down.

7.12 Submenu Diagnosis – "read only" Parameters

Submenu Diagnosis

To enter this menu you have to press the ↓ button, to leave the menu, press the →button longer than 3 sec.

7.12.1 Pump Runtime

Pump Runtime 0000 Std.

Shows the running hours of the pump.

7.12.2 Pump Address

Pump-Address 1

This window shows the adjustment of the pump address (only readable).

7.12.3 Error memory

The last three error messages are always saved in an internal memory. The error signals can not be deleted!

Last Error .....

Shows the last error

2nd Error .....

Shows the Error before the last error

3rd Error .....

Shows the Error before Error 2

7.12.4 Software Version

Software CP – VOG: 004

This parameter shows you the used software version of the HYDROVAR.

8 Controller menu of the programming device

To reach the controller menu, you have to press ➔ on the controller for longer than 3 sec., when the

1st display

POWER X.X %
SPEED X.X Hz

The actual values are displayed.

is shown. Then the display will change to

Address 01
P1:run

The actual pump-address is shown

P1 ...Master
P2 ...Slave
P. ... not active

run ... HVS running
disabled ... HVS is not ready / extern on /off
stop ... HVS is ready, but not running
Error ... Error message or no supply voltage

Then press ← on the controller to change to

8.1 Controller menu Configuration

Submenu Configuration

To enter this menu you have to press the ↓ button, to leave the menu, press the ➔button longer than 3 sec.

8.1.1 Automatic connection to the programming device

Auto Connecting Enabled

! Only valid for programming device!

Auto connecting enabled: after plug in the programming device, it changes automatically to the inverter menu. During this auto connection the programming device is looking for a valid address and "SCAN CONNECTION" is shown on the display.
Auto connecting disabled: there is no automatic connecting with the pump (choose the address)
Auto connecting will be saved after leaving the submenu Configuration

8.1.2 Software Version

Software: Software: VOGREM-XXX

In the second line of the display, there is shown the version of the software of the programming device and also the date of programming of this software.

8.2 Submenu address

Submenu Address

To enter this menu you have to press the 🡻 button, to leave the menu, press the 🡺button longer than 3 sec.

8.2.1 Change of pump address

Address Change 00--> 00 *

Addresses from 01 to 04 can be set in this parameter.

To change the address it is not necessary to cut the interface connection to other HYDROVARS.

On the left side there is shown the address of the HYDROVAR, which you want to select (select the address by using the buttons 🡹 or 🡻). On the right side, you can select a new address also with the buttons 🡹 and 🡻. You only can select an address, which is not used in the pump group!
To change between left and right side, press button 🡸 or 🡺. The star shows the actual used side.

If you have selected mode "MASTER-SLAVE" it is important that each Hydrovar has it's own address from 01 to 04

To save the new selected address press both buttons (🡸 and 🡺) together for 2 sec. If it was successfully you will see the same address on both sides.

To leave the submenu press the 🡺 key for 3 sec.!

9 Possible Error messages

You have to connect the programming unit to read the error message on the display.

After the cause has been remedied, the malfunction has to be reset by cutting off the power supply for >30 seconds.

The last 3 error messages are saved in SUBMENU DIAGNOSIS

9.1 Overheating – Motor

XXX Error-Mot-Temp

Possible causes: insufficient cooling, ambient temperature is too high or motor overloaded.

9.2 Overvoltage

XXX Error-Overvolt

Possible causes: Check mains supply, supply voltage too high, peak voltage owing to switch heavy loads on the network, or RAMP 2 is to fast! Find the cause and take countermeasures (e.g. network filter, RC-elements).

9.3 Undervoltage

XXX Error-Undervolt

Possible cause: Check mains supply, faulty fuse or phase unsymmetry.

9.4 Overload

XXX Error Overload

Possible causes: false data settings or the pump is working at a capacity significantly in excess of its performance data.
Ramp 1 to fast
Max. frequency to high
Boost to low

9.5 Overheating of the heat sink

XXX Error KK-Temp

The thermal sensor, mounted on the cooling body of the HYDROVAR indicates over temperature.
Possible causes: insufficient cooling, ambient temperature is too high or motor overloaded.

9.6 Error Power measurement

XXX Error Powermeas

No detected signal from the power measurement.
Possible causes: wrong connection on the control card

9.7 Additional internal processor Error messages:

ERROR 1	:	EEPROM-ERROR (corresponding data block malfunction)
ERROR 2	:	Not used
ERROR 3	:	Processor RAM error
ERROR 4	:	Not used
ERROR 5	:	Processor ROM error
ERROR 6	:	Watchdog error
ERROR 7	:	Timer error (quartz)
ERROR 8	:	Programme error

These ERROR signals are acknowledged by disconnecting the power supply for > 30 seconds.
If the error signal should appear again, contact customer service and provide a detailed description of the error.

10 Possible indications of the LED on the HYDROVAR

.) Green shining ⇒ Motor stopped
(via external stop with terminals X2/4; X2/5
or the unit is stopped with the ▼ button on the front plate)

.) Green slow flashing ⇒ Inverter is active, but the motor has stopped

.) Green fast flashing ⇒ Motor runs

.) Orange/green flashing ⇒ connected external programming device

.) Orange shining ⇒ LEARNING – change speed with the buttons ▲ and ▼, or the external programming device is connected and the pump is stopped with the button ▼ on the Hydrovar or with the external release input (terminals X2/4 and X2/5).

.) Orange fast flashing ⇒ EMERGENCY MODE - speed can be changed with the buttons ▲ and ▼

.) Red shining ⇒ error signalling (type of the Error is shown on the display of the external programming device)

.) Red flashing ⇒ signalling of a fatal error (HYDROVAR has to be disconnected from the power supply!)

11 Maintenance

The Hydrovar control unit does not require special maintenance.
However, the cooling fan and the vent should be freed of dust occasionally.
Fur further information, please ask your distributor!

Manufacturer's Declaration

as defined in EC Machinery Directive 98/37/EEC, Appendix II B and the EMC Directive 89/336/EEC

We herewith declare that the frequency converter of type

HYDROVAR HVS 1.1, 1.15, 1.2
HYDROVAR HVS 3.2, 3.3, 3.4

is intended for assembly with other machines to a machine. It is forbidden to start using it until it has been established that the machine on this converter is to be installed or with which this converter is to be assembled complies with the provisions of EC Directives.

Relevant technical standards and specifications, especially

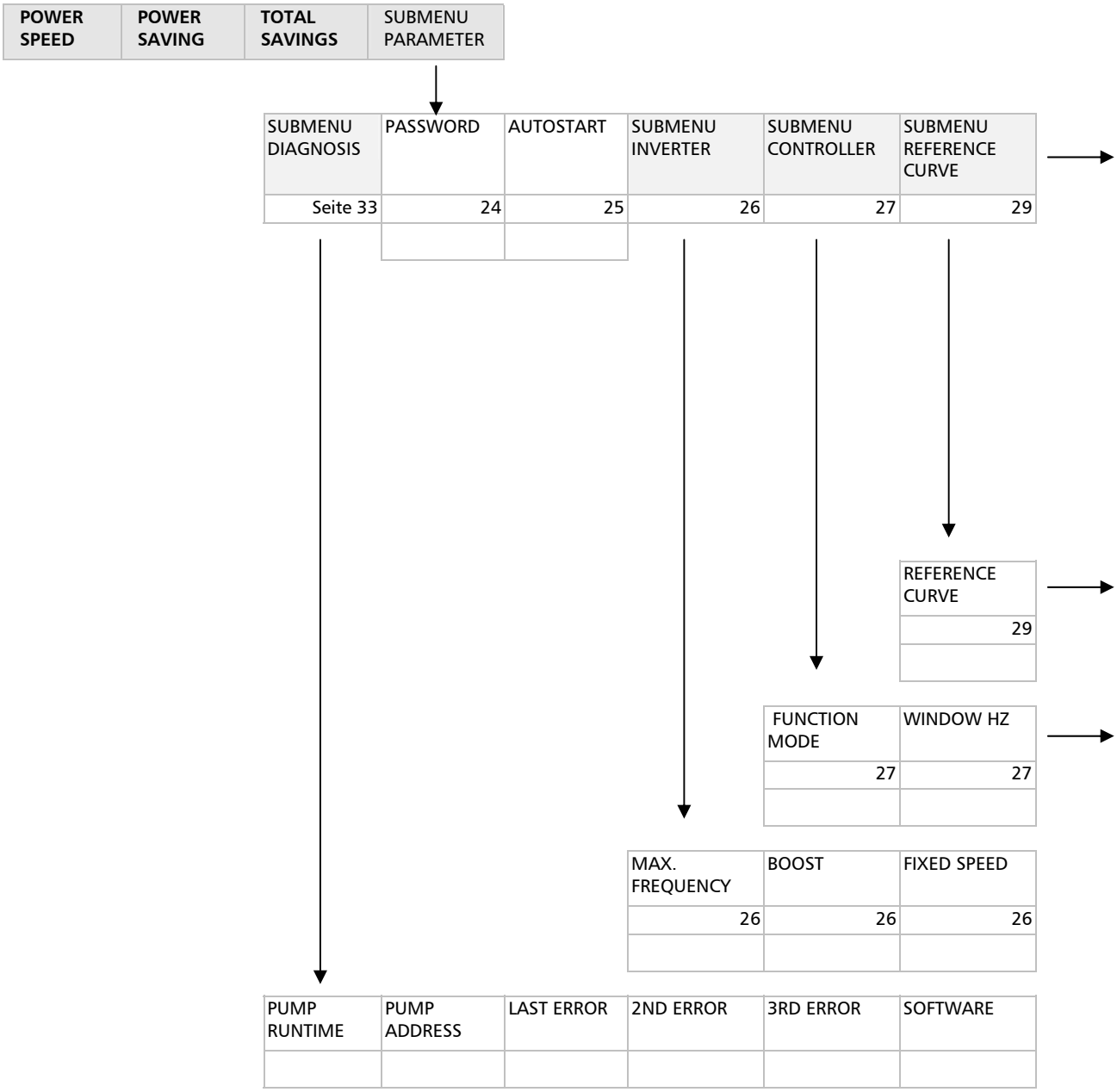
EN 55011 Class B

EN 61000-6
EN 60146
EN 50178
EN 60204-1

.....

Dir. Ing. Sacher
Pumpenfabrik ERNST VOGEL GmbH
A-2000 Stockerau, Ernst Vogel-Str. 2

Stockerau, 20.08.03


POWER SPEED
POWER SAVING
TOTAL SAVINGS
SUBMENU PARAMETER
SUBMENU DIAGNOSIS
PASSWORD
AUTOSTART
SUBMENU INVERTER
SUBMENU CONTROLLER
SUBMENU REFERENCE CURVE
Seite 33
24
25
26
27
29
REFERENCE CURVE
29
FUNCTION MODE
WINDOW HZ
27
27
MAX. FREQUENCY
BOOST
FIXED SPEED
26
26
26
PUMP RUNTIME
PUMP ADDRESS
LAST ERROR
2ND ERROR
3RD ERROR
SOFTWARE

SUBMENU TESTRUN	SUBMENU ECONOMY	MODE CONTROLLER	SWITCH INTERVAL	SET PASSWORD	LEARNING	DEFAULT
30	31	32	32	32	32	32

CURRENCY	RATED POWER	COSTS/KWH	CLEAR SAVINGS
31	31	31	31

START TEST RUN	ENABLE TEST RUN	TEST FREQUENZY	BOOST TEST RUN
30	30	30	30

POWER FREQ.	PASSWORD 2	COEFF A	COEFF B	COEFF C
29	29	29	29	29

WINDOW Fx	SHIFT	ACCEL HIGH	DECEL HIGH	ACCEL LOW	DECEL LOW
27	27	28	28	28	28

Order no.	
HYDROVAR	
Pump	
Note:	
Date / Name	

Hauptsitz-Headquarter

LOWARA s.r.l.
Via Lombardi, 14
36075 Montechio Maggiore
I-Vicenza – Italien
Telefon: +39 0444 707111
Telefax: +39 0444 492166
E-Mail: mkt@lowara.ittind.com
www.lowara.com

LOWARA-Niederlassungen-Subsidiaries

LOWARA DEUTSCHLAND GMBH
Biebigheimer Strasse 12
D-63762 Großostheim
Telefon: (0 60 26) 943-0
Telefax: (0 60 02) 943-210
E-Mail: info.de@lowara.ittind.com
www.lowara.de

LOWARA FRANCE S.A.S
BP 7311
F-37073 Tours Cedex 2
Tel: +33 2 47881717
Fax: +33 2 47881700
E-Mail: info.fr@lowara.ittind.com
www.lowara.fr

LOWARA FRANCE SAS Agence Sud
Z.I. La Sipière
BP 23
13730 Saint Victoret - F
Tél: (0033) 04 42 10 02 30
Fax: (0033) 04 42 10 43 75

LOWARA NEDERLAND B.V.
Postbus 54
NL-4180 BB Waardenburg
Tel: +31 418 655060
Fax: +31 418 655061
E-Mail: info.nl@lowara.ittind.com
www.lowara.nl

LOWARA PORTUGAL
Comércio de Bombas Lda
Praceta da Castanheira
Lote 6 Barca
P-4470 Maia
Tel: +351 22 9478550
Fax: +351 22 9478570
E-Mail: lowaraportugal@mail.telepac.pt

LOWARA IRELAND Ltd.
59 Broomhill Drive
Tallaght Industrial Estate
Tallaght – Dublin 24
Tel: +35 31 4520266
Fax: +35 31 4520725
www.lowara.ie

LOWARA UK Ltd.
Millwey Rise Industrial Estate
Axminster
GB-Devon EX13 5HU
Tel: +44 1297 630230
Fax: +44 1297 630270
E-Mail: uksales@lowara.ittind.com
www.lowara.co.uk

LOWARA UK Ltd. Regional sales office
Unit 1, Byram Industrial Park – Low street
Brotherton, Knottingley WF 11 9 HS
West Yorkshire
Tel: +44 1 977 607 267
Fax: + 44 1 977 607 226
E-mail: salesuknorth@lowara.ittind.com
www.lowara.co.uk

ITT FLUID TECHNOLOGY INT.(ASIA PACIFIC) PTE Ldt.
298 Tiong Bahru road, 03-04/06 Tiong Bahru Plaza
Singapore 168730
Tel: +65 2763693
Fax: + 65 2763685

ITT FLUID TECHN. INT. (AUSTRALIA) PTY Ltd.
18 Commercial Drive, Dandenong South
Victoria 3175 AUSTRALIA
Tel: +61 3 97065066
Fax: +61 3 97066065

VOGEL PUMPEN

Pumpenfabrik ERNST Vogel GmbH

A-2000 Stockerau
Ernst Vogel-Strasse 2
Telefon: 02266/604
Telefax: 02266/65 311
Internet: www.vogel-pumpen.com
www.hydrovar.com

A-8054 Graz Seiersberg
Kärntnerstrasse 518
Telefon: 0316/28 6120
Telefax: 0316/28 70 42

A-9020 Klagenfurt
Schachterlweg 58
Telefon: 0463/31 93 20
Telefax: 0463/31 93 17

A-4600 Wels
Haidestrasse 41
Telefon: 07242/66 8 51,52,53,54
Telefax: 07242/66 8 51/12

A-6175 Kematen
Bahnhofstrasse 31
Telefon: 05232/20 0 01
Telefax: 05232/20 0 03

Tochterunternehmen in Europa
Subsidiaries in Europa

LOWARA-VOGEL Szivattyú Kft.
H-8000 Székesfehérvár
Bakony u. 8
Telefon: 0036/22/512 640
Telefax: 0036/22/512 642

Lowara Vogel Polska sp.zo.o.
PL-40652 Katowice, ul. Worcella 16
Telefon: 0048/32/202 8904
Telefax: 0048/32/202 5452

VOGEL-ROCANO SA
CH-2087 Cornaux, Z.I. Prés-Bersot
Telefon: 0041/32/75 87 200
Telefax: 0041/32/75 87 200